

REMARKS

Claims 1 - 22 are pending in the present Application. Claims 1, 5, 6, 11, 12, 16, 17 and 21 have been amended, Claim 23 has been added, leaving Claims 1 - 23 for consideration upon entry of the present Amendment. No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Priority

Examiner has stated “[t]he application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. The current status of all non-provisional parent applications referenced should be included” (Office Action dated 07/27/04, page 2)

This issue has now been addressed with an amendment to the specification in the section titled “CROSS-REFERENCE TO RELATED APPLICATIONS”

Double Patenting Rejection

Claims 1 – 22 are rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over Claims 1 – 15 of U.S. Patent No. 6,730,720 to Gohr et al. (Gohr). (Office Action dated 07/27/04, page 2)

In making the rejection, the Examiner has stated that “[a]lthough the conflicting claims are not identical, they are not patentably distinct from each other because they claim the same method using the same materials”. (Office Action dated 07/27/04, page 2)

A terminal disclaimer is being filed herewith, thereby rendering this rejection moot. Reconsideration and withdrawal of this rejection and allowance of the claims is hereby respectfully requested.

Amended Claim

Claims 1, 11 and 12 have been amended to correct for an inadvertent typographical error caused by the exclusion of the term “sulfonate”. The term has now been included.

Claim 1 has been amended to correct for an inadvertent typographical error caused by

the inclusion of the term “comprises”. The term has now been removed.

Claims 5, 6, 16 and 17 have been amended to correct for inadvertent typographical errors as well as to provide the proper antecedent basis. None of the aforementioned amendments were made to overcome any of the references cited by the Examiner.

Claims 1 and 21 have been amended by removing the terms potassium diphenylsulfone sulfonate and sodium diphenylsulfone sulfonate respectively. This was done to better define the invention and not to overcome any references cited by the Examiner.

New Claims

Claim 23 has been newly added. Support for this new claim can be found in Claims 1 and 21 as originally filed.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 1, 11 and 12 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Office Action dated 07/27/04, page 3) In particular, the Examiner has stated that

“[p]otassium perfluoropropane” in claim 1, lines 7 – 8, “tetrabutyl ammonium perfluorobutane” in Claim 11, line 7 and “tetrabutyl ammonium perfluorobutane” in Claim 12, line 7 are not flame retardant salts. “Sulfonate” is missing in all three instances.

(Office Action dated 07/27/04, page 3)

The Examiner has also stated that “[f]urthermore in Claim 1, line 4; the word “comprises” is unnecessary” (Office Action dated 07/27/04, page 3)

Claim 1, 11 and 12 have been amended to include the term “sulfonate”.

Claim 1 has been further amended by removing the term “comprises”.

The inclusion of the term “sulfonate” in Claims 1, 11 and 12 and the removal of term “comprises” from Claim 1 renders this rejection moot. Applicants respectfully request a withdrawal of the rejections under 35 U. S. C. § 112, second paragraph.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1 – 9, 21 and 22 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Patent No. 5,449,710 to Umeda et al., (Umeda) in view of U.S. Patent No 6,353,046 to Rosenquist et al. (Rosenquist) or U.S. Patent No. 4,130,530 to Mark et al. (Mark), further in view of U.S. Patent No. 5,663,280 to Ogoe et al. (Ogoe '280) or U.S. Patent No. 5,041,479 to Ogoe (Ogoe '479). (Office Action dated 07/27/04, page 4, point 9)

In making the rejection, the Examiner has stated that

[i]t would have been obvious to one having ordinary skill in the art, at the time the invention was made, to masterbatch the composition of the primary references, in order to improve the flame retardance and the Izod impact and to take advantage of the better dispersion of the additives.

(Office Action dated 07/27/04, page 4) Applicants respectfully disagree with the rejection.

Additionally the Examiner has stated that “[c]laims 1 – 9, 21 and 22 are rejected under 35 U. S. C. 103 (a) as allegedly being unpatentable over Ogoe '280, Ogoe '479 in view of Rosenquist, Umeda or Mark.” (Office Action dated 07/27/04, page 4)

In making the rejection, the Examiner has stated that

it would be obvious to one having ordinary skill in the art; at the time the invention was made, to add the cyclic siloxanes to the compositions of the primary references, in order to reduce the melt viscosity of the polymer and to take advantage of the better dispersion of the additives.

(Office Action dated 07/27/04, page 4) Applicants respectfully disagree.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496

(C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Claim 1 of the present application is directed at a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of potassium perfluoromethylbutane sulphonate, potassium perfluoromethane sulphonate, potassium perfluoroethane sulphonate, potassium perfluoropropane sulfonate, potassium perfluorohexane sulphonate, potassium perfluoroheptane sulphonate, potassium perfluorooctane sulphonate, and mixtures comprising at least one of the foregoing flame retardant salts; pelletizing the concentrate; and, blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Claim 21 is directed at and claims a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, wherein the flame retardant salt is selected from the group consisting of sodium perfluoromethylbutane sulphonate, sodium perfluoromethane sulphonate, sodium perfluoroethane sulphonate, sodium perfluoropropane sulphonate, sodium perfluorohexane sulphonate, sodium perfluoroheptane sulphonate, sodium perfluorooctane sulphonate, sodium perfluorobutane sulfonate, and mixtures comprising at least one of the foregoing flame retardant salts; pelletizing the concentrate; and, blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition.

Claim 22 is directed at a method for reducing haze in fire resistant polycarbonate compositions, comprising blending flame retardant salt with a first polycarbonate to produce a concentrate, pelletizing the concentrate; and blending the pelletized concentrate with a second polycarbonate and a cyclic siloxane to form a fire resistant polycarbonate composition; wherein a 4.5 mm thick chip formed from the fire resistant polycarbonate has a percent haze of 0.51 to 1.23.

Umeda teaches a flame retardative polycarbonate resin composition which comprises 100 parts by weight of an aromatic polycarbonate resin (A), 0.01 to 0.5 part by weight of an alkali/or alkaline-earth metal salt of a perfluoroalkanesulfonic acid (B), 0.03 to 5 parts by weight of an organopolysiloxane containing organoxysilyl group bonded to a silicon atom through a divalent hydrocarbon group (C), and optionally 5 to 120 parts by weight of an inorganic filler. (see Abstract) The organopolysiloxanes disclosed by Umeda are required to have an organoxysilyl group as shown in formulas VII and VIII (Col. 7, lines 20 – 36).

Umeda teaches that the resin composition can be prepared by compounding components (A), (B) and (C) and kneading the resulting compound. (Col. 11, lines 33 – 38) More specifically, Umeda does not teach first manufacturing a pelletized concentrate that comprises a flame retardant salt and a polycarbonate. For this reason at least, Umeda does not teach all elements of the claimed invention.

Rosenquist teaches manufacturing a fire resistant polycarbonate composition by incorporating into polycarbonate, a fire retardant component containing a perfluoroalkane sulfonate and a cyclic siloxane. (see Abstract) Rosenquist discloses that in order to use polycarbonates in many applications, it is necessary to include additives which retard the flammability of the material and/or which reduce dripping. (Col. 1, lines 11 – 14) Rosenquist, like Umeda, does not teach first manufacturing a pelletized concentrate that comprises a flame retardant salt and a polycarbonate. Rosenquist therefore does not make up for the deficiency of Umeda.

In addition, one of ordinary skill in the art upon reading Umeda would find no motivation to combine it with Rosenquist. Since, neither Rosenquist nor Umeda teaches or suggests the use of concentrate, one of ordinary skill in the art upon reading Umeda would find little reason to search for Rosenquist to combine it with Umeda.

Additionally, Rosenquist cannot be combined with Umeda in the manner made by the Examiner in point 9 on page 4. In the first instance, there is no motivation to combine Rosenquist with Umeda since the organopolysiloxanes of Umeda require the presence of an organoxysilyl group, while the cyclic siloxanes disclosed by Rosenquist do not contain such organoxysilyl groups. The exemplary cyclic siloxanes disclosed by Rosenquist in Col. 2, lines

38 – 61 does not contain organoxysilyl groups. Similarly, Rosenquists's examples in Col. 3 through Col. 5, use octaphenylcyclotetrasiloxane as the cyclic siloxane.

Octaphenylcyclotetrasiloxane too does not contain an organoxysilyl group. Thus one of ordinary skill in the art upon reading Umeda would not have combined it with Rosenquist in the manner made by the Examiner.

Mark teaches a plasticized polycarbonate composition comprising high molecular weight aromatic carbonate polymer and a minor amount of a cyclic siloxane plasticizer (See Abstract). Mark, like Umeda and Rosenquist, does not teach first manufacturing a pelletized concentrate. Mark therefore does not make up for the deficiencies of Umeda or Rosenquist.

Additionally, Mark does not teach fire retardant compositions that contain flame retardant salts and therefore does not provide any motivation for one of ordinary skill in the art to combine it with Umeda. To the contrary, one of ordinary skill in the art desirous of manufacturing a flame retardant composition would be demotivated from combining Mark with Umeda, since Mark does not even teach or disclose flame retardancy or haze reduction.

Further since Mark like Rosenquist, does not teach cyclic siloxanes that contain organoxysilyl groups, one of ordinary skill in the art upon reading Umeda would find no motivation to substitute the cyclic siloxanes of Umeda with those disclosed by Mark.

Ogoe '280 teaches a carbonate polymer composition comprising a carbonate polymer, a low volatility aromatic phosphate ester compound, and optionally an alkali metal salt having a pH of at least 7 (see Abstract). In the first instance, Ogoe '280 does not teach or disclose the use of cyclic siloxanes. While Ogoe '280 in Col. 18, line 66 does disclose masterbatching (i.e., manufacturing a concentrate), the additive masterbatch disclosed by Ogoe '280 is not the same as the concentrate presently claimed. For example, Ogoe '280 teaches adding a phosphate ester and an alkali metal salt to a carbonate polymer to form the additive masterbatch. (Col. 18, line 66 – Col. 19, line 5) The additive masterbatch together with the UV stabilizer, antioxidant, epoxidized soybean oil are combined with linear polycarbonate and pelletized in an extruder. (Col. 19, lines 6 – 67). Thus, the additive masterbatch disclosed by Ogoe '280 is a granular mixture that has not been blended and pelletized as is presently claimed. After pelletization, Ogoe '280 does not teach or disclose any additional

blending. In other words, Ogoe '280 does not teach a "let down" step, i.e., the masterbatch disclosed in Ogoe '280 is not further blended with additional polycarbonate.

The claimed invention in contrast is directed to first blending the flame retardant salt with polycarbonate to make a pelletized concentrate and subsequently blending the pelletized concentrate with additional polycarbonate (i.e., the second polycarbonate) and a cyclic siloxane to manufacture the fire resistant polycarbonate. Thus, Ogoe '280 too does not teach all elements of the claimed invention. As a result, combining Ogoe '280 with Umeda, Mark and Rosenquist would still not produce the claimed invention.

Further, Ogoe '280 teaches that the objective of its invention is to produce a carbonate polymer having a UL-94 V-2 performance level. (Col. 4, lines 3 – 4) Ogoe '280 further teaches that in order to obtain a UL-94 V-2 rating, the addition of an aromatic phosphate ester compound to the polycarbonate will promote sufficient dripping to remove the burning polymer from the part being tested thereby achieving the desired UL-94 V-2 rating. (Col. 4, lines 54 – 60)

In the first instance, it is submitted that there is no motivation to combine Ogoe '280 with Rosenquist since the teachings of Ogoe '280 are in direct contradiction to those of Rosenquist. As noted earlier, Rosenquist teaches a flame retardant polycarbonate composition, where dripping during a flame retardancy test is to be reduced. Ogoe '280 on the other hand teaches a composition containing an aromatic phosphate ester in an amount effective to facilitate dripping during a flame retardancy test. (Col. 4, lines 54 – 60) One of ordinary skill in the art upon reading Rosenquist would not attempt to combine it with Ogoe '280, since the teachings of these respective references are mutually exclusive. The Applicants also contend that the combination of Ogoe '280 with Umeda, Mark and Rosenquist was made in hindsight using the present invention as a template.

Ogoe '479 discloses making a concentrate by pelletizing a carbonate polymer comprising one or more additives selected from the group consisting of a metal salt, a halogenated aromatic compound, a metal salt of an inorganic compound, a free aromatic sulfimide and a fibril forming polytetrafluoroethylene (see Claim 1). The Examples of Ogoe '479 teach manufacturing a concentrate comprising all of the additives and the polycarbonate

in a single step. (see Examples 1 – 3 in Col. 3, line 64 to Col. 4, line 50) The concentrate is then let down with only the base polycarbonate resin. Ogoe '479 states that “[t]he improvement of Izod impact via the use of IR concentrate is attributed to more uniform dispersion using IR concentrate than using IR masterbatch”. (Col. 5, lines 32 – 35) The Examiner has cited this as motivation for using a concentrate.

The Applicants would like to direct the Examiner’s attention to the attached Declaration, which in turn references two earlier declarations –Declaration A and Declaration B submitted in support of the invention in the parent application i.e., U.S. Application Serial No. 09/749,645 filed on December 27, 2000, now U.S. Patent No. 6,730,720. In Declaration A and Declaration B, a fire resistant polycarbonate comprising polycarbonate, the flame retardant potassium salt of perfluoro butane sulfonate (KPFBS) and a cyclic siloxane was tested for impact resistance as well as for other relevant properties. The fire resistant polycarbonate in the respective Declaration’s A and B was manufactured in the manner claimed in the present application. While the fire retardant salt in the Declarations A and B is the potassium salt of perfluoro butane sulfonate (KPFBS), it is submitted that since this salt belongs to the same family as the fire retardant salts claimed in Claim 1 and Claim 21 they would behave in a manner similar to the potassium salt of perfluoro butane sulfonate (KPFBS). The attached declaration attests to this.

In Declaration A, Table 1 shows the impact properties for a fire resistant polycarbonate comprising polycarbonate, potassium salt of perfluorobutane sulfonate and cyclic siloxane. Sample 6 in Table 2 shows impact properties for a polycarbonate that does not contain any flame retardant salt. Similarly, Table 1 of Declaration B also shows impact properties. From Tables 1 and 2 of Declaration A as well as Table 1 of Declaration B, it may be seen that there is no statistical difference between the impact properties of a polycarbonate sample that does not contain the flame retardant salt (sample 6 in Table 2) and polycarbonate samples that contain various levels of the salt. Since the impact resistance does not vary with salt content, it can be clearly seen that the use of a concentrate does not improve the impact properties of the polycarbonate sample as maintained by the Examiner. It is further submitted that this lack of an improvement in the impact properties reflects that there is no improvement

in dispersion as the result of using a concentrate. Even if there was an improvement in dispersion, it does not appear to manifest itself in measured mechanical properties and the improvement in the haze is solely the result of synergy between the cyclic siloxane and the fire retardant salt. Thus there is no motivation to combine Ogoe '479 with either Umeda, Rosenquist or Mark, since the use of a masterbatch does not improve the impact properties or the dispersion as claimed by the Examiner.

In addition, the Examiner has stated that "adding a cyclic siloxane to the compositions of Ogoe '479 and Ogoe '280 would reduce the melt viscosity of the polymer and facilitate better dispersion of the additives". (Office Action dated 07/27/04, page 4) However, Rosenquist proves that this is inaccurate. A review of Tables 1A, 1B, 1C, 1D, 2A and 2B in Rosenquist clearly shows that this increasing amount of the cyclic siloxane do not always reduce viscosity. For example, Column 5 of Table 1C shows a composition that contains 0.07 wt% of KPFBS and 0.05 wt% of cyclic siloxane while Column 1 of Table 1D shows a composition that contains 0.07 wt% of KPFBS and 0.1 wt% of cyclic siloxane. The melt flow of both compositions is 15.8. Similarly, Column 7 of Table 2A shows a composition that contains 0.09 wt% of KPFBS and 0.05 wt% of cyclic siloxane while Column 3 of Table 2B shows a composition that contains 0.09 wt% of KPFBS and 0.1 wt% of cyclic siloxane. Here, the composition containing the larger amount of siloxane has a higher viscosity thereby disproving the Examiner's contention. Thus the Examiner's contention that the cyclic siloxane reduces the viscosity is incorrect.

While there is no decrease in viscosity with increasing cyclic siloxane content, there is a detrimental decrease in the heat distortion temperature as is detailed below. From Table 1 of Declaration B it may further be seen that there is a decrease in the heat distortion temperature (HDT) test and the softening temperature derived from the Vicat test. Such a reduction in softening temperature is detrimental to a flame retardant composition since it is generally desirable to have deformation occur at as high a temperature possible when heated or subjected to a flame. Thus from the above data, it is quite clear that the addition of the cyclic siloxane to the flame retardant polycarbonate composition containing a flame retardant salt does not improve the impact properties or the dispersion, but instead causes a decrease in the

softening temperature of the composition which is generally undesirable. Thus once again, there is no motivation to combine Ogoe '479 with Umeda, Rosenquist or Mark, since there is no advantageous change in viscosity to facilitate an improved dispersion, but rather there is a detrimental effect on the high temperature properties of the fire retardant polycarbonate composition.

The Applicants contend that the Examiner has combined Umeda, Mark, Rosenquist and Ogoe '479 only as a result of hindsight provided by the claims of the present application. In this regard the courts have stated that "[t]he references, when viewed by themselves and not in retrospect, must suggest the invention". *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975). Applicants further maintain that the Examiner has improperly used Applicants disclosure to select portions of the cited references to allegedly arrive at Applicants invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicants invention as a whole in contravention of §103, including the disclosures of the references that teach away from Applicants invention.

In conclusion, since Umeda, Rosenquist and Mark do not teach all of the claimed elements and since there is no motivation to combine the aforementioned references with Ogoe '280 and Ogoe '479, the Applicants contend that the Examiner has not made a prima facie case of obviousness over Umeda, Rosenquist, Mark, Ogoe '479 or Ogoe '280. Additionally, since the KPFBS belongs to the same family of fire retardant salts as those claimed in the present application, Applicants believe that they should behave in the same manner. Applicants respectfully request a withdrawal of the rejection under 35 U. S. C. § 103 and an allowance of the claims.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0862.

Respectfully submitted,

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